

CHATARD (T.M.)

*With the Compliments of the Author.*

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ANNUAL ADDRESS OF THE PRESIDENT  
OF THE  
CHEMICAL SOCIETY OF WASHINGTON.

The Abuse of Explosives,  
WITH  
Suggestions for Preventive Laws.

BY  
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# ANNUAL ADDRESS OF THE PRESIDENT,

DR. THOMAS M. CHATARD.

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## THE ABUSE OF EXPLOSIVES, WITH SUGGESTIONS FOR PREVENTIVE LAWS.

MR. PRESIDENT, MEMBERS OF THE CHEMICAL SOCIETY, LADIES AND GENTLEMEN: When a scientific society confers the honor of its presidency, it also lays upon the recipient the duty of preparing an address which shall be—in intention, at least—of general interest, and shall present its subject as free as possible from technical details.

If any apology were necessary for asking your attention this evening to some considerations as to the proper manner of preventing the vicious use of explosives, it would be found in the mere enumeration of instances of such abuse which have lately occurred. Between December 9, 1892, and January 9, 1893, the newspapers noted *eight* criminal explosions, including the Paris and Dublin outrages; two explosions through carelessness, at Long Island City and Lake Hopatcong, N. J., and one arrest of a woman at Martin's Ferry, Ohio, who was about to carry out her announced intention of blowing up a neighbor's house, and was heavily provided with explosives.

Moreover, the Paris explosion occurred on December 29th, but was preceded and followed by published threats from prominent anarchists. As the purpose of such outrages is to excite and terrify the public, vague but sanguinary utterances are much in favor with the anarchist. Often these have no real foundation, but the willingness to claim all the discredit has its full bearing.

It is of great importance to society that such abuse of explosives shall be prevented, but it is of equal importance that no repressive



measures shall be adopted under the influence of panic. Such remedies may easily prove worse than the disease. Legislation is necessary, but cannot be properly framed without a clear understanding of the nature of explosives and explosions, and of the conditions of legitimate manufacture and use, together with due regard for the necessities and convenience of the law-abiding, and careful consideration of the limitations imposed by our form of government and the habits and customs of our people.

Having had a limited experience both in the manufacture and use of explosives, it has seemed to me that the present opportunity might be improved by presenting to you my views of the subject of preventive legislation. They are offered as a contribution to a discussion—not as a final solution. The practical difficulties are numerous and great. Many of which I was unaware have become evident to me since beginning the preparation of this paper. Certain lines of procedure will be indicated, certain changes in laws and customs suggested. If criticism and discussion can be aroused, if those who have more special knowledge or who, as public men, are entrusted with the interests of the country can be induced to take hold of this matter and develop effective means of protective reform, my purpose will be attained.

The first question for us to consider is, What is an explosive? In a broad sense, altogether too many things may produce explosion—a badly-tended boiler, a leaky gas-pipe, the water-back of the kitchen range, a weak soda-water bottle, may all be included. Nay, even the “harmless necessary” troche in the form of the chlorate of potash lozenge has produced disastrous effects, as in the case of the gentleman of Boston who, shoving his watch into his pocket with undignified rapidity, found that this action was followed by loud reports, smoke, fire, flames, and much destruction to clothing and cuticle. Investigation proved that he was in the habit of carrying, loose in his pocket, certain lozenges which, consisting of chlorate of potash and sugar, did not differ much in composition from some well-known explosive mixtures.

Again, all combustibles become explosive if they are so finely divided that they can remain suspended in air. Under such conditions we have the so-called “dust explosions,” occurring in coal mines, grist mills, furniture factories, &c. Even finely divided metals have been known to oxidize with explosive violence, as was

the case with zinc dust at the works at Bethlehem, Pa., in 1854. To this class may be added mixtures of inflammable gases and vapors with air, since these are but examples of exceedingly minute subdivision.

In every case combustion takes place. Whether or not the combustion is explosive depends upon the space of time required for the combustive action. The products of this action are gases, the volume of which and their pressure upon surrounding matter increase with the temperature of the reaction. The highly heated gases expanding follow the line of least resistance, so that if the material is unconfined and the speed of combustion is not too rapid, the gaseous products escape into the air and no explosive effects occur, as in the deflagration of colored fires. If the combustible and its products are confined, but the combustion is sufficiently slow, we have a character of explosion represented by the discharge of a gun. The powder charge is confined by the gun-barrel and by the ball. Combustion of gunpowder being progressive and gradual, the gases act along the line of least resistance, which is that of the ball. This is started on its journey by the evolution of the first portion of gas, the remainder of which accelerates its speed, so that it leaves the muzzle with its greatest velocity. If the resistance of the ball should be in any way greater than that of the barrel, a bursted gun is the result.

Now, in case of the high explosives, not only is the absolute volume of gases given off by the combustion of a given weight of the substance greater than that produced by the same weight of gunpowder, but the rapidity of combustion is far greater, not being gradual but practically instantaneous. According to Prof. Munroe, the velocity of combustion for gunpowder is 1-5 feet per second, for guncotton 15,000-18,000 feet.

With such velocities as these there is practically no line of least resistance, the inertia of the atmosphere being then as great as that of solid bodies. Hence if ordinary guncotton be substituted for the powder charge of a gun, the breech of the gun will burst before the ball can be moved; this will probably happen even if there is no ball, the resistance of the air in the barrel being quite sufficient.

The combination of rapidity of explosion and of atmospheric



inertia has given rise to the often met-with misstatement that nitroglycerin and its congeners act downward. People have seen that if a gunpowder cartridge is exploded on the surface of the earth the latter is but little disturbed, while a dynamite cartridge under similar circumstances makes a considerable hole. Hence the conclusion that dynamite acts downward. It is almost needless to say that, owing to inertia, the air is quite as resistant as the earth. Both are disturbed, but the effect on the latter is permanent. The hole that was simultaneously made in the atmosphere was invisible, and has been filled up by an inrush of surrounding air, the effects of which are often remarkable. An instance is noted by Prof. Munroe where dynamite was exploded on an iron block placed in a field of well-grown grass. After the explosion, it was found that the inflowing air had moved with sufficient velocity to mow down the grass for several feet around the block as neatly as could have been done with a scythe, and this grass was stacked upon the block.

There are two kinds of explosion—by ignition, as with gunpowder; by detonation, as with nitroglycerin. Detonation is instantaneous explosion, and occurs always with some explosives, as, for example, the fulminates, and most of them can be detonated by appropriate means.

With this understanding of the general nature of an explosive, we may now define it, in the words of Dumas-Guilin, as “a substance, solid or liquid, which under the influence of an external agitation, by heat, electricity, or mechanical shock, suddenly decomposes, disengaging a large volume of gas accompanied by a high temperature, resulting in a high pressure.”

According to the rapidity of this decomposition, such substances can be divided into low explosives—represented by gunpowder and the various smokeless powders—and high explosives, like the fulminates, nitroglycerin, military guncotton, and many other allied chemical compounds.

I do not propose to weary you by any detailed description of the various kind of explosives, but it is well for us all to understand one thing at the outset. A very large number of explosive compounds have been discovered and their properties have been studied. The force of any possible explosive can be predicted by the laws of thermo-chemistry, and it can be said that the

strength of the most powerful explosive that is theoretically possible does not exceed in any great degree the strength of those we already possess. This branch of knowledge has been developed by scientific observation and investigation, and not by guess-work or the lucky hits of the ignorant. "Fools have rushed in," but if they have returned alive their intellectual baggage has not been much increased by chance plunder. Let us not be excited either by the exaggerated statements of those interested in introducing new compounds or by the vague but ferocious assertions of anarchists and others who, through a mistaken idea of the sanctity of human liberty, are permitted to utter with impunity their wild outcries.

The means of destruction are only too plentiful, but there are no secret and dreadful forces at the disposal of any evil-doer. So far from this, the materials used for outrages are, from the nature of the case, never stronger—generally much weaker—than those employed for legitimate purposes.

For the present we shall consider the high explosives only. All of them may be classed as nitro-compounds—that is, as materials produced by the action of nitric acid on organic substances. Under this action glycerin, cotton, and carbolic acid yield, respectively, nitroglycerin, guncotton, and picric acid. Like cotton, all other forms of cellulose, as also the allied sugars, starches, and glues, yield explosive nitro-compounds, and, like carbolic acid, the various derivatives of coal-tar can be nitrated. As strong acid is necessary and as one of the products of the reaction is water, concentrated sulphuric acid is, in some instances, added to the nitric acid to take up the water and prevent the dilution which would interfere with the process. The nitration must be followed by careful washing, and the last trace of free acid be removed, else the product will be unstable and spontaneous decomposition may set in with disastrous results.

Nitroglycerin is made by the action of a mixture of nitric and sulphuric acids on glycerin. To obtain it in a strong, stable condition the most concentrated and purest materials must be used, and the washing must be thorough. Thus prepared it is a colorless, oily liquid of a specific gravity of 1.6. If ignited in an unconfined condition, it burns like oil; but if confined, explosion takes place through overheating, the exploding point being  $356^{\circ}$



F. It freezes at  $40^{\circ}$  F, and is then exploded with difficulty, but is particularly sensitive when thawing. Careless thawing is the cause of many so-called "accidents," notably that at Long Island City Dec. 28, 1892, when five people were killed and many injured. Nitroglycerin and its compounds, such as dynamite, must never be used while at all frozen, but the thawing operation is very easy and perfectly safe when properly done. Nitroglycerin, if carefully made and purified, may be kept for an indefinite time without change and without danger. A sample which I helped to make at the Torpedo Station at Newport in 1872 was unchanged and in perfectly good condition when I last saw it, in 1881. Two years later it was unfortunately destroyed by those ignorant of its value, but I am informed that no observable alteration had then taken place. A life of eleven years is surely a test of the stability of such a substance.

As its liquid condition is an inconvenience, nitroglycerin is generally prepared for use by mixing it with solid absorbents. Nobel, the first to do this, used infusorial earth and obtained a solid product containing 75% of nitroglycerin. This he called dynamite. As this name is now commonly applied to all solid explosives containing nitroglycerin, Nobel's preparation is called dynamite No. 1, and is generally taken as a standard for comparison. The dynamites fall into two classes—those with an inactive absorbent base like dynamite No. 1, and those with active bases, which take part in the explosion, being in fact gunpowders of varying composition. They are much used and their varieties and names are legion.

Explosive guncotton is not much used except for military purposes. Photographic guncotton, which is soluble in ether, forming the well-known collodion, is employed for making explosive gelatin by dissolving it in nitroglycerin. This gelatin is very powerful, but its cost prevents its general use, and its stability has been questioned. The guncottons are extensively employed in the manufacture of smokeless powders—a rapidly developing and most important branch of explosives. Every great nation is striving to obtain a better smokeless powder than its neighbors possess, and it should be gratifying for us to know that the United States is believed to have the best yet invented.

Picric acid and its allied nitro-compounds are of great impor-



tance. Melinite, a French preparation concerning which such astounding statements have been published, is said to consist mainly of picric acid mixed with collodion. By mixing these nitro-compounds with oxidizing agents powerful explosives are formed; thus picric acid acted on by nitric acid yields the material from which Emmensite is made, dinitrobenzine and nitric acid form the German compound Hellhoffite, while mononitrobenzine mixed with chlorate of potash is Rackarock, used in such large quantities in the great Flood Rock explosion. As it was selected for the work after most careful investigation, its good qualities appear to be demonstrated. According to the tests of the U. S. Board of Ordnance, the most powerful explosive known appears to be Perunite. The following table from the report of Cols. Abbot and Mordecai, Oct. 12, 1891, is very interesting as giving an idea of the relative strength of some typical explosives under like conditions:

Perunite, B. . .	17.57	Rackarock . . .	9.36
Perunite, C. . .	15.61	Emmensite . . .	5.49
Perunite, D. . .	13.66	Guncotton . . .	3.16
Explosive gelatin, . .	10.00	U. S. rifle powder . .	1.72

On such a scale dynamite No. 1 would be about 7.5. Perunite A, stated to be a mixture of 80 volumes of nitroglycerin with 10 volumes each of nitromethyl and nitroethyl, being a liquid, was considered unfit for military purposes and was not tested, but would probably prove to be strongest of all.

For the detonation of all these bodies another nitro-compound, fulminate of mercury, is employed. This has long been known as the explosive in the ordinary percussion-cap. Blasting caps are similar, but contain larger charges of fulminate. This substance, however ignited, always detonates, and by the wonderful violence of its explosion causes the detonation of other explosives. By using sufficiently large charges of fulminate even ordinary gunpowder can be detonated.

We see now that all explosives, as to their nature and mode of production, can be divided into a few classes; that the processes of manufacture are in principle very simple; that all sorts of mixtures can be made, and that these are easily exploded. Under such conditions it is evident that prevention of their vicious use is surrounded with peculiar difficulties in addition to

those which are always met with in attempting to control the sale or use of articles for which there is a legitimate general demand.

Granting the necessity of legislation to prevent abuse of explosives, we may lay down the general principle that it cannot be made effective if it interferes unduly with legitimate manufacture and employment.

In all engineering work, high explosives, when used, are not luxuries but necessities. Not only can work be done more cheaply by their aid, but often could not be done without them. In very hard and tough materials, or in rocks that are full of crevices, only the sudden and powerful blow of a detonating explosive avails; the slower action of gunpowder blowing out the tamping in the one case or allowing the gases to escape through the crevices in the other. Other examples might be given, but it is perfectly well known that this necessity is absolute, and that the great development of the explosive business has been caused by the demand of the engineer. He requires that his explosives shall be safe to transport, store, and handle, certain and powerful in action, and that the combustion shall be complete, leaving no deleterious residues. To satisfy these requirements the manufacturer must employ all the resources of skill, and only well-managed works can produce reliable articles in an economical manner.

Now I do not believe that the abuse of explosives can be prevented by governmental inspection or supervision of manufacture, transportation, or even sale. The laws of France are most minute on these points, but do not prevent outrages. Legal regulation may and can protect the workman, the inhabitants of a neighborhood, the transportation agents, or the travelling public. For excise purposes, supervision of sale may be necessary, but cannot prevent crime. Explosives purchased from legal dealers and strictly according to provisions of law may be unlawfully used; they may be stolen from lawful possessors by intending evil-doers, or the latter can easily obtain the materials for making their own explosives. Nitric-acid, an essential, has such extended uses that it can be bought at any druggist's. Nor is it necessary to purchase the acid, as it can be easily made by distilling a mixture of nitrate of soda and sulphuric acid, both of which are in



common use among farmers for composts and other home-made fertilizers.

It is also very likely that in most cases of carefully planned outrages the explosives would, in part at least, be made by the conspirators. The bombs employed for the assassination of Alexander II are thus described by J. E. Muddock in *Littell's Living Age*, 1888 :

"This much is certain. A student in the school of chemistry at St. Petersburg sent to the committee at Paris a formula for the preparation of an explosive compound. This compound, while having a glycerin as a base, was not what is commonly called nitroglycerin, but was far more powerful. \* \* \* The reason the explosive was not prepared in Russia was owing to the difficulties in the way of procuring the ingredients without exciting suspicion. The bombs, however, were made in St. Petersburg. This important work was placed in the hands of one Keebalchich, the son of a priest. This man had studied for the church, but had subsequently entered the school of Government Engineers.

"The bombs were conical in shape, the conical end being so weighted that, on falling, that part of the bomb was sure to strike the ground first. In the extreme tip of the shell and also in a circle round the end, percussion-caps were sunk. These in turn communicated with a slender steel tube that extended from tip to base of the shell; this tube was filled with the special explosive. It was a clear amber-colored fluid, but thick like golden syrup. \* \* \* If two or three drops of the stuff were allowed to fall upon a hot stove they instantly produced an enormous and blinding sheet of brilliantly white flame, without noise or smoke, but with a peculiar odor resembling burning leather.

"Around the steel tube blasting-powder was rammed tightly, and between the powder and the walls of the shell was a layer of guncotton. At least half a dozen of these shells were manufactured, together with some of a more ordinary kind, while two were made of glass and filled with dynamite."

How effective the bombs proved is well known. As to the absolute strength of the secret explosive, it was probably not greater than that of a solution of guncotton in nitroglycerin,

which it much resembled as far as the description goes, or it may have been similar to the Perunite A, already noted. The description of the bomb sounds very diabolical, but it was no worse than many other forms which have been proposed for use in warfare. The Russian conspirators seem to have been fully abreast of their time in knowledge and ingenuity, but hardly much ahead of it.

Why a special and secret compound was made for this purpose is explained above, but is also due to another reason. In any group of such conspirators the man who can make such things has a certain pre-eminent standing and influence among his fellows. Superior rank is not less dear to the all-levelling anarchist than to the staunchest upholder of the divine right of kings. Hence such a man will always try to make it appear that he can furnish destructive agents far superior to those from any other source, and as he is not hampered by scientific observation, criticism, and tests it is easy for him to demonstrate to his more ignorant companions that he controls a terrible substance of which, like the school-boy's nicotine, "a drop put on the tail of a dog will kill a man."

Although governmental supervision of manufacture, storage, transportation, sale, and use cannot be relied upon to prevent the vicious use of explosives, still this supervision would be an important aid. Moreover, such supervisory control, if acting under acceptable regulations, can be made very beneficial to this industry, and would be welcomed by most of those immediately interested. Col. Majendie, Chief Inspector of Explosives for the English Government, made, in 1874, a most interesting and valuable report on the operation of the laws affecting the manufacture and handling of gunpowder. In this he shows that the English powder-makers, far from objecting to a rigid system of control, were glad to record themselves in favor of it, if it were made reasonable and general, and then rigorously enforced.

The reason for this is plain. Arrangements for the protection of the works, the workmen, and the neighborhood cost money, both to introduce and to maintain. If one manufacturer endeavors to protect his works or workmen by special improvements, care, and regulations, he will not be able to produce as cheaply as his competitors, if the latter are permitted to work



without restriction. The same thing is true in the case of transportation agencies and dealers. The former often find it necessary to make regulations governing the transportation of explosives, and should always be aided by the law in enforcing them.

Such regulations when made by private individuals or corporations are always difficult to enforce. Even when clearly made for their own protection, workmen often stubbornly resist them and try to evade them in every way, nor is it easy to punish disobedience when detected. Nor is the general public much superior in this respect. The cry of tyranny is raised, and the demagogue, in his glory, vehemently denounces these encroachments on freedom.

If this supervision is desirable, it must come through the operation of a national, general law, which shall provide a certain minimum of regulation, means for its enforcement and penalties for violation.

The law should be national and general, passed by Congress and enforced by the General Government. State laws, however good, stop at the State line, and the best intentions of local legislators are often paralyzed by representations that their action will "drive away business," "lose votes," or any other of the cant phrases. The present condition of the oyster industry in Maryland is an instructive lesson, for there a small minority of people, who are well intended but ignorant of their true interests, have successfully resisted every attempt to prevent them from killing their goose, to the damage of the interests of the entire State.

The law should provide a certain *minimum* of regulation—should be a minimum law.

Before attempting to frame such a law, a careful investigation and study of the practical requirements should be made by a commission appointed for the purpose.

It should be made clear to all those interested—manufacturers, railroad men, dealers, engineers, miners, quarrymen, and other workers—that their opinions, advice, and criticism are sought for and are welcomed; that no legislation will be recommended until its provisions and their practical effect have been thoroughly discussed and substantially agreed to by them; and that no more legislation will be attempted than that which they themselves

consider as the minimum amount necessary for the general welfare and protection.

Intelligent newspaper discussion will be especially valuable, for it will clarify the public mind and detect deficiencies and defects which might otherwise escape notice until a time when their discovery might inflict serious injury to the whole matter.

Having thus investigated the subject, the commission can present to Congress its conclusions in the form of a general law providing for this minimum amount of control. As this law will have been already thoroughly discussed, understood, and approved, the final sanction should be easily obtained.

A law thus carefully framed should need but little machinery for its enforcement. Regulations suitable and acceptable to each branch of the business can, in the light of the previous investigations, be easily made under its provisions, and when officially promulgated would be binding on all. Methods of procedure against offenders should be simple, direct, and summary.

Any serious attempt to prevent the vicious use of explosives will, however, compel us to go further, but in the same direction. We must have a national and general license law, under which the *simple, unlicensed possession* of any explosive, except those especially excluded, shall be punishable. The excluded explosives should be fireworks and ordinary gunpowder, either loose or in cartridges. Fireworks are sufficiently well looked after by local authority, and any attempt to interfere, in this manner, with the use of gunpowder will result in failure. We must not attempt the impossible; what is possible will be hard enough to attain.

The wording of the licenses will have to be varied to suit the circumstances; but in fact but few forms will be necessary. They should be obtainable at the least possible cost, with the least possible inconvenience; and the granting of them should not be discretionary, but be under rules clearly laid down. Discretionary action in this connection is wholly unnecessary and would be injurious.

How such a law would work in practice will best be shown by considering some particular cases.

A chemist desires to carry on an investigation in explosives. He personally presents his written application, giving whatever



information the general regulations may require, and receives his license. This entitles him and his assistants under his direction to do whatever work he may desire within the limits of his laboratory, but does not permit him or any one else to carry his explosives outside of those limits, or even to take them to some other place for further experimentation. For this purpose another form of license, equally easily obtainable, should be required. These restrictions interfere in no way with his scientific or practical work, but do aid in protecting the public.

Now let us consider the mining industry. If the license system will work well in that branch of engineering, it ought to in any other.

A new mine is to be opened, and somebody is put in charge of the work. When it becomes necessary for him to procure explosives he goes to the nearest licensing office, files an application, which, again, is made out according to a prescribed form, and on payment of a very small fee receives an appropriate license. This license confers upon the licensee the right to store and use explosives upon the mining property, the name, location and limits of which are sufficiently nearly described in the license. Outside of those limits the license is entirely void. Included, but in express terms, is the permission to purchase explosives of any kind or in any quantity, whenever and wherever the licensee may desire, and to convey the same to the property, either from the dealers direct or from the most conveniently situated public transportation point. The license should be personal and non-transferable, should run for not more than one year from date, and then *absolutely* expire. Renewal, if desired, should be an entirely new transaction, which can occur during the life of the first license, which must, of course, be simultaneously surrendered and destroyed. There would be no increase of restrictions on the purchase of explosives in consequence of this license law. The dealer should not be required to know that the purchaser is licensed. If any sale restrictions are introduced, these should come through the operation of the general code of dealers' regulations, framed for their protection, as previously indicated.

In the same way the transportation agents need only require that the packages of explosives are properly prepared for shipment, according to their own special code. Their responsibility

would be the same as at present and would cease with the delivery of the goods.

As to the conveyance of the explosives from the dealer's store or the railway station to the mine, this should be covered by the license. Some regulation for wagon transportation may be necessary, but otherwise no special liability should attach to the teamster during *bona fide* transit.

The explosives having reached the mine are issued to the miners for use. This use is covered by the license to the superintendent, who may, as at present, make whatever rules for its conduct he may deem advisable. Certain regulations, however, should be made obligatory by law. In some cases the miners are furnished with explosives at the expense of the mine; in others they buy them from the management as they do their oil, candles, etc. If, at the end of his shift, a miner has any surplus explosive, he must deposit this in an appropriate place, provided by the company, where he can get it at the beginning of his next shift. Whether he has purchased it or not should make no variation in this regulation. Under no circumstances should he be permitted to take explosives to his dwelling-place, even if this be within the limits of the mining property. His family and neighbors must be protected. As to carrying it outside of those limits, both superintendent and miners stand on an equal footing. Both are absolutely forbidden to do so.

If work is to be done on a neighboring property, another license must be obtained for this. If the general magazine is situated on the first property, the new license can permit conveyance from one place to the other.

There is no occasion for licensing the individual miners, nor should this ever be done. There should be but one license for any one place, and that should be issued to the superintendent alone. Only through his permission can any one, within the limits of the property, legally have possession of any explosive.

With some changes in language the mining license will serve for the needs of the farmer, who sometimes finds it advantageous to use high explosives for the removal of stumps and rocks, and for other purposes—within the limits of his farm he may use them; outside of it, not at all.

A special form of license covering a certain district, say a



county license, will be necessary for well-diggers and others whose work is in the form of jobs of indefinite duration and location. The same may be said of prospectors, whose mode of life and manner of work present peculiar difficulties in the way of control.

Having in this manner provided for the needs of all legitimate business, we can then insist that the unlicensed possession of explosives shall be punishable, without reference to the intentions of the transgressor. The law of the District of Columbia concerning concealed weapons is an example. A man may be arrested for some trifling offence, but it is found that he has upon his person a concealed weapon. He makes no attempt to use it, but he has it. When he is brought up for trial he may even be acquitted of the offence, but is fined \$50 or punished by an equivalent imprisonment for having the weapon. His intentions are not considered; the fact is sufficient for condemnation, and there is no appeal. Of course the previous arrest has nothing to do with this, except as having given the opportunity to ascertain the fact.

Some such summary proceeding will be necessary under the license law if this is to be effective. Inasmuch as there will be no reason for unlicensed possession, the proof of fact will be sufficient. As the licenses are local and limited, the chances of detection of illicit actions will be greatly increased, as the real licensees and the nature of their licenses will be generally known. Moreover, any licensee transgressing the limitations of his license becomes at once amenable to a punishment, which some of his neighbors at least will see to it that he gets.

In offences against this law, evil intentions should be presumed. If their absence can be satisfactorily proven, then the punishment can be reduced to a minimum; but there should always be a punishment, which for many reasons should be an imprisonment, with or without a fine, but need not be heavy or severe.

Dynamite outrages are generally planned and the explosives procured some time in advance. The power of summary arrest for possession conferred by this law would much increase the chances of prevention, for it would only be necessary for some secret information as to this possession to reach the proper authorities to enable them instantly to arrest the offending parties.

The finding of the explosive would be quite sufficient for condemnation without the necessity of exposing the informer. During the resulting imprisonment further investigation could be made, but one such arrest would probably prevent the execution of the plan by the others concerned. Again, if the penalty for simple possession be not made too severe, the probability of obtaining such secret information will be much greater. As the laws are at present, should any one of a group of conspirators be seized with remorse and desire to prevent an intended outrage, he can only do so, effectively, by betraying the criminal intentions of his fellows. He knows that if he does this he will probably be compelled to give public testimony upon which may depend the lives of others who have trusted him and who are probably no more guilty than he. Moreover, through this publicity not only must he undergo all the obloquy which society, while availing itself of his services, heaps upon the informer, but also expose himself to private vengeance. This he may well hesitate to do; but if such a man knew that by merely revealing the fact of possession the outrage could be prevented without exposing any one of his fellows to any greater punishment than that attaching to illegal possession, it is reasonable to suppose that useful pre-repentance would be more frequent. It is prevention, not punishment, that is to be sought for.

The power of summary action and arrest for possession is indispensable. The authorities should be empowered to act at once upon information, and no other warrant for search or arrest should be required. Secrecy and suddenness of action will have a far more paralyzing effect upon the dynamiter than any display of the majesty of the law, which it is his purpose and study to defy and make contemptible. To those who may object that such proceedings would be too high-handed, unconstitutional, etc., it may be replied that it is time that some of the technicalities that have been carefully built up around our laws should be swept away and justice be less impeded. It is time that some change should be made in the principle that law-abiding people must wait until the vicious perform overt acts before any legal steps can be taken to restrain them, and that then these steps, to be legal, must be according to rules apparently framed to give the greatest amount of trouble and expense to the prosecutor and the greatest chance of escape to the offender.

On one occasion, at the conclusion of a long legal consultation about some mining titles, I asked the three lawyers present as to what legal measures I might take to prevent sluice-robbing. They all agreed that a warrant, with all the attendant steps of prosecution, would be the only legal means of procedure even if the offender were caught in the act. This last condition would, of course, somewhat complicate the question, but the general result would be the same. When it was explained to them that this view meant, under the circumstances, no legal protection at all, and that, according to the customs of most mining regions, when anybody was caught sluice-robbing, somebody died immediately, they mitigated the force of their opinion by agreeing that although such was the law, still if I took the matter into my own hands popular opinion would probably support me. I could quote other instances when lawyers have advised me that what may be termed, in short, personal violence was the only remedy for defects not so much in law as in legal practice. Now, I submit that such a state of affairs is altogether wrong. Law is law and should be obeyed, but it should be even and just to all, sufficiently searching to detect any offender and powerful enough to punish him. We too often read in our papers that such a one will probably get off easily because he has friends and money. Whether such a statement is true or not, it is generally believed, and such a belief fertilizes the soil on which anarchists are grown.

Again, a little less consideration for the convenience and the comfort and the safety of the evil-doer would be rather a good thing. Those of you who have read Booth's "In Darkest England" may remember his remarks, "that it would be utopian, in our present social arrangements, to dream of obtaining for every honest Englishman a jail standard of the necessities of life." It is generally believed that the English prisons are quite models of their kind.

My own experience of the nature of criminal punishment in this country has been mainly confined to what I have observed in the convict camps of the South, denunciations of which have lately been so rife in the papers. Of these I can say that though the labor was hard, it was useful and was no harder than any other mining labor, the shelter was sufficient, and the food, though coarse, was nourishing and ample. Nor in talking to the



men either as prisoners or when, afterwards, they were in my employment, did I hear of any special abuses other than those which would have occurred among the same class of men had they been free. Now, this mode of punishment is considered by many to be inexpressibly barbarous, so that the ideal prisons must be quite agreeable places, certainly quite superior to the refuges provided for the honest poor, for whom, I am glad to say, I have far more sympathy.

We do not need very severe laws to check dynamite outrages. A law which is plain, just, and simple—under which detection will be easy and punishment certain—will require no heavy penalties to make it effective, so far as mere unlawful possession is concerned; but any attempts to make a criminal use of explosives—any threats, verbal or written, to do so—any incitements, verbal or written, of others to make such use against anybody in particular or society in general, or any expressed approval of such actions, should meet with speedy and severe punishment, which no legal technicalities should be permitted to delay. Such things are done and said to disturb and terrify the public, and usually by persons to whom the certainty of close confinement at hard labor will act as an effective deterrent. The Johann Mosts, O'Donovan Rossas, and Louise Michels of society would speedily find their occupations and themselves gone to the penitentiary, where their usefulness to the world would be much increased.

Of course those who are entrusted with the execution of such a law must be especially watchful lest its purpose be perverted to a means for private revenge or persecution, or for "put up jobs." These may occur in any branch of criminal law, but must always be suspected and looked for in this connection, since secret information must be so much depended upon. If their existence is proved, the offenders should be most heavily punished, and none of the technicalities impeding convictions for perjury in ordinary cases should be permitted to have any force here.

I have said that the licenses should specify the use. This should be broadly considered. What is meant is that such misuses, as killing fish with dynamite, explosions for amusement, etc., shall be absolutely prohibited, license or no license. They are either barbarous or wholly unnecessary.

The excluded explosives are fireworks and gunpowder. All

desirable amusement and noise can be obtained by their use. It is true that quite as disastrous outrages can be perpetrated by the aid of gunpowder as by that of dynamite, but its employment has not such a terrifying effect upon the public, who are accustomed to its use, which they could not be deprived of even if this were desirable. The recent introduction of smokeless powders for sporting purposes brings in, however, new complications. These powders are from two to four times as powerful as ordinary gunpowder, and are quite as effective for outrages as any of the dynamite preparations. How far their use should be controlled would be a matter for special consideration, but I think that a license ought to be required for their possession. Convenient as they are, they are not necessary either for sport or protection. The great hunters, such as Gordon-Cumming, had not even breech-loaders; the old flint-lock served our purpose at Bunker Hill and Bennington, and was more than we wanted at Bladensburg; while if any son of the revolution, American or otherwise, will load up his ancestor's horse-pistols and shoot as straight as we hope the old man did, his burglar will be as completely *hors de combat* as if he had been operated on by the latest improvement in firearms.

In speaking of laws concerning explosives I have said that they must be national and should be *minimum*. The meaning of this term may require some explanation.

I think that it will be well for us all to seriously consider whether this country has not reached a stage in its development when its future strength and prosperity require that many matters which have up to the present time been considered as being in the care of the several States shall be handed over to the charge of the General Government. National quarantine, immigration, bankruptcy, divorce and marriage laws, seem to be imperatively demanded by circumstances. Other national laws are also needed. Only by being national and enforced by national means can any of them be made effective.

There is, however, a very strong and wide-spread opposition to increasing the powers of Congress to control the affairs of the States; and as this opposition is based on many traditions of our Government and is supported by the wording of many parts of our Constitution, it is reasonable and must be respected.

But I cannot but think that much of this opposition could be overcome if the principle were laid down that, in all such legislation, Congress should confine itself to the *minimum* of control—that is, that the national laws should be the simplest and most lenient that will suffice for the purpose. If, then, any State should desire to supersede the national law by a stricter one of its own, it should be at full liberty to do so. For example, a national divorce law might state the general nature of the causes of divorce and the method by which a divorce, valid for the entire country, can be obtained. A certain State, however, does not wish to recognize any cause for divorce, or perhaps only one. Its law, being stricter, should stand, and no divorce be obtained within its boundaries except through its own regulations. What would be gained by this national law is that every citizen of the United States would know that he is protected up to the limits of the law, and that no advantage can be taken of his ignorance of the different codes of the various States.

If these national laws clearly state their intention and scope, provide penalties for offenders, and give ample authority to those entrusted with their enforcement, the details of operation and the preparation of regulations may safely be left to the executive management. Our Congress represents the entire country, and the opposition of a few should not be permitted to damage the many. Those of us who believe that we are citizens of the United States and belong to a nation—and, so believing, favor such national laws—may expect to be met with the cry of “unconstitutional,” but we do remember that some of our greatest national successes have been attained by overleaping the boundary walls erected by the founders of our Constitution, and that some of our greatest dangers have come from “strict constructionists.”

But if change is needed let it come with due consideration, and let it be minimum. We may think that the house in which we and our fathers before us were born requires extensive repair and alteration; but it is a good house, and with the cutting of a window here and the strengthening of a floor there, and perhaps the building of some small addition, will do for many years yet.

In conclusion, you may think that as to this abuse of explosives I have told you little that is new and have thrown little light



on the problem of prevention. You are right. The matter is very dark, the way out of all the difficulties very obscure. Not until all objections have been met and answered by a general principle of action can we say that we have reached solid ground on which to erect our legal edifice. Until we have our foundation secure it would be worse than useless to build our walls.

But I do believe that the principle is correct, that Congress should have full power to enact what I have called minimum laws, binding on the entire country and enforceable by the authority of the General Government. The full independence of the States is preserved if the laws are just, general, and equal in application everywhere.

Everybody is greater than anybody. All the States are greater than any one. Our Congress is the representative of the nation, and as our national protection against external enemies is by our Constitution entrusted to the General Government, so also may safely be our defence against internal foes.







